AMERICAN FOUNDATION FOR THE BLIND INC.
~~GIFT OF~~

TESTS AND MEASUREMENTS IN MUSIC

ADAPTED

FOR USE WITH BLIND SUBJECTS

by

Marion Kappes

Submitted in partial fulfillment of the requirements
for the degree of Master of Arts in
Western Reserve University

May 1, 1930

HV 1660
K

TESTS AND MEASUREMENTS IN MUSIC ADAPTED
FOR USE WITH BLIND SUBJECTS

CONTENTS

	Page
I. PURPOSE OF THE PRESENT STUDY	1
II. MEASUREMENT IN MUSIC	
1. Its relation to the psychology of music	2
2. Experimental analysis of talent	4
3. Purpose and types of formal tests	7
4. Standardized tests	9
5. Non-standardized tests	11
6. Questionnaires and rating blanks and their use	16
III. DISCUSSION OF THE TESTS	
1. Ratings of the various tests	18
2. Applications and interpretations	25
IV. ADAPTATION OF TESTS FOR USE WITH THE BLIND	
1. Need of objective measurement	28
2. Braille music notation and the mechanics of braille	32
3. The technique of adaptation	34
4. Adaptation of phonograph tests	36
5. Adaptation of printed tests	40
6. Administration of the tests	48
7. Scoring the tests	50
8. Suggested forms for questionnaires	51

V. A TENTATIVE PROGRAM FOR THE FURTHER DEVELOPMENT OF MUSIC TESTS FOR THE BLIND 52

APPENDIX

A. Bibliography i-vi

B. Forms for questionnaires vii-ix

C. Index of tests x-xiii

SUPPLEMENTARY VOLUME I

Test forms and instruction blanks

Key to braille music signs

SUPPLEMENTARY VOLUME II

Braille text of test forms and manuals

(See index of tests)

TESTS AND MEASUREMENTS IN MUSIC ADAPTED FOR USE WITH BLIND SUBJECTS

PURPOSE OF THE PRESENT STUDY

The present study of tests and measurements in music aims to present to educators of the blind and all interested in their special talents and abilities, first: a survey of the available material in this field; second: discussion and criticism of the usefulness of such measures; third: an outline of the technique of their adaptation for use with tactual readers; and fourth: a suggested program for the further development of such material and for its use in institutions and day school classes for the blind.

Granted that measurement of the musical ability of blind individuals is desirable, and since no systematic study of ways and means of attaining satisfactory results in such measurement has as yet been undertaken - or since, at least, no definite plan of procedure is available - it seems of practical importance to inquire first of all what measures have been put to use in the general field. It will be pertinent to sketch their relation to the psychology of music; to describe their aims and review briefly the uses to which they have been put and the results obtained.

Careful study of the tests themselves and the details of modification necessary for use in braille should result in the development of a well defined technique of

adaptation which, if valid, should be applicable not only to existing tests but to similar ones which may be developed later. It should also render immediately available a body of material whose worth can only be determined as it is put to actual use.

MEASUREMENT IN MUSIC

Its relation to the psychology of music

A study of testing in the field of music is a concentration on a new and still immature branch of a department of psychology which in itself has had a very recent development. It is important before narrowing down the discussion of musical measurement to the tests themselves to realize clearly its place in the larger attempt at the understanding and scientific analysis of music and musicality.

That branch of psychology known as the psychology of music has its roots in physics, in physiology, in philosophy, and of course in psychology itself in its more general ramifications. It has gradually emerged from studies in acoustics, in hearing, in aesthetics; psychologically, it is concerned with mental phenomena, motor response and activity, and sensitivity in several fields. It is based on data concerning the unmusical as well as the musical person, the musically trained individual and the musical genius; it has to do with innate capacity,

with musical performance, with the effects of music, and with the form and content of music itself. Nor is a psychology of music complete without some consideration of the learning process, imagination, habit, association and so on. A realization of the extent of the sources which have been explored in building up this exceedingly complex science is necessary for a fair appraisal of the test and measurement movement and of the content of the tests themselves.

As we survey the material that has been put out in the interests of musical measurement we are confronted with many tests whose significance in connection with music as we experience it is so remote that we are inclined either to discredit entirely the point of view which the scientist brings to bear on music or else to go to the other extreme and accept as a complete and final index of musicality, as measure which has been proposed merely as a means of indicating the relative value of one factor of musical talent as compared with another factor, or has been designed for use in a rough ranking of members of a group as regards some one talent.

Such warped points of view are particularly in evidence in any discussion of those tests which were the first to enter the field and which still hold the place of most importance among the measures of musical talent, namely, the Seashore tests. The importance of these tests, as well as of any of the others which have been developed later, rests upon the theories of musical talent and the

analysis of the musical mind on which they were bases. These theories and analyses have grown out of a great variety of investigations and experiments of which the most extensive and important are those of Seashore and his associates at the University of Iowa.

Experimental analysis of talent

The analysis of musical talent on which Seashore bases his tests is the most detailed which has been put forward. A complete inventory of the factors of the musical mind is given in Seashore's Psychology of Musical Talent.[1] These are grouped under the main headings of

---

[1] p.7

---

musical sensitivity, musical action, musical memory and imagination, musical intellect, and musical feeling. It is important to note that the six tests which are known to the public as the Seashore measures of musical talent represent only about a fourth of the factors which Seashore himself lists as constituting musicality.

Studies by other experimenters have resulted in other observations and theories in regard to the essentials of musical capacity and the possibilities of testing for them.

Schoen made a study of a boy prodigy (45) and as a result proposed an inventory consisting of two types of factors, primary and secondary. As primary factors he names acoustic sensitivity, including keen discrimination in matters of pitch, intensity, duration and consonance; musical sensitivity, under which heading function absolute pitch, relative pitch, tonal memory, tonal sequence and rhythm; and musical virtuosity, which is dependent on motor capacities on which technique is based. As secondary factors Schoen lists intelligence, musical memory, will power and resolve, self-confidence, temperament, and the early appearance of talent.

Another study of a musical prodigy, that by Revecz, was the basis of an attempt to construct tests which might lead to the early discovery of talent.[a] Vocal reproduction was assumed by Revecz to have high diagnostic value. He found that the possession of a sense of rhythm was less significant than, for instance, the ability to transpose intervals vocally and to analyze simultaneous intervals, the possession of absolute pitch, and the power to reproduce a known melody on an instrument. Revecz concludes that talent makes its appearance early and that musicality is a wide-spread, innate ability which cannot be directly measured by means of tests having a high correlation with it.[1]

---

[1] Psychological Bulletin, Vol.18, p.125, 1921

Investigations carried on by Pear (42) have led to his conclusions that the person who in ordinary terminology is known as musical, possesses traits which elude determination by tests and which are most clearly indicated by an expresses interest in music, by the possession and use of auditory imagery, the capacity to image a complex auditory stimulus - such as an orchestra for instance - and the avowed importance of music in general life.

Schüssler(46) drew his deductions from a statistical examination of unmusical children - unmusical that is on the basis of grade in singing. He finds interval memory of the greatest significance for musicality, and considers absolute pitch of importance only in cases of outstanding talent.

A study of musical ability by Mjöen(35) made with methods designated as indirect (anamnestic) and direct (symptomatic) results in the analysis of musical ability into the following component faculties: discrimination of pitch, intensity, time, and tone-interval; determination of pitch; tonal memory; determination of interval and tone-purity; tone-memory; discrimination of key (major and minor) discrimination of consonance and dissonance; analysis of tone-complexes; discrimination of harmonies; musical imagery; rhythmic memory; discrimination of species of time; reproduction of tunes; singing of a "second" part; determination of absolute pitch (qualitative); emotional musical reaction. The appearance of musical talent is explained by Mjoen on

the basis of heredity.

That musicality is closely related to superiority in intellectual achievements is the conclusion of several investigators including Stumpf, Schussler, the Pannenborgs, as well as Cox, whose contributions to the Genetic Studies of Genius (5) include historical survey and analysis of the evidence of mental endowment in the lives of several famous musicians of the past.

Still another consideration not to be disregarded in the total inventory of musicality is the fact, as pointed out by Bernfield, that even the individual who according to tests, possesses all of the elements of musical ability, may not acquire even an appreciation of music if, owing to some early inhibitory influence, he lacks the will to be musical.

Investigations such as these indicate the bases of the tests of talent which have been formulated and at the same time suggest further refinements in musical measurement for future development.

Purpose and types of formal tests

The general purpose of all scientific testing in music is to discover, analyze, and rate musical talent and to indicate the lines of most effective training of such talent as may be found. That the tests in present use fall far short of this ideal purpose is admitted by most of the test enthusiasts as well as by the sceptics among psychologists, musicians, and educators. It is not

claimed for these tests that they tell us all we need to know about the potential musician, since they are necessarily confined to those phases of musicality which are, in our present state of knowledge, judged to be measurable. Nor indeed is it claimed that they reveal with any great degree of precision the individual rankings in the fundamental capacities which they do measure. It is faith in the ideal value of science in matters of art and in the ultimate attainment of a much more highly perfected testing program in music which gives strength and impetus to the movement.

There are two types of tests in use: first, those having to do with native endowment - the "aptitude tests" and second, those having to do with learning, knowledge, and training. These are the "achievement tests." The first are strictly psychological while the second belong rather to the province of education. The first group have been devised largely on the basis of conclusions drawn from investigations carried on in the psychological laboratory while the second for the most part have been constructed to conform to certain standards of knowledge accepted in the school room or conservatory. The first group attempt to answer the question,,"Of what is the subject capable in the field of music?" the second type would answer the question, "To what extent has he realized his capacities?" Both kinds of tests should be of interest to those who are concerned with the selection and development of musical talent.

Standardized tests

Kwalwasser, in his bibliography of objective tests in music,[1] lists them under six main headings, sensory, feel-

[1] Kwalwasser, Jacob: Tests and measurements in music, p.138

ing, motor, knowledge or learning, appreciation, and musical performance tests. Under sensory tests he gives Seashore's six measures of musical talent, which measure pitch discrimination; intensity, time, consonance, and rhythmic discrimination and tonal memory. This series of tests is obtainable in the form of phonographic records which may be purchased from the Columbia graphaphone company. A manual of directions containing keys and instructions for scoring comes with the records. The second group of sensory tests listed are the two prepared by Max Schoen and described by him in the Journal of Comparative Psychology, volume V, number 1, for February 1925, namely, the "Test of Relative Pitch" and "Rhythm." These so far as we have been able to ascertain have not been published for distribution but a reprint from an article in the Musical Quarterly containing the test material may be purchased from the publishers.[2]

[2] G. Schirmer, Inc. New York

Since the printed material is to be used by the examiner no specially designed forms are required and record blanks for

answers may be prepared as desired to suit local needs.

Under feeling tests Kwalwasser includes his own "Tests of Melodic and Harmonic Sensitivity" and Schoen's "Test of Tonal Sequence." The former is in record form and may be obtained together with a manual of instructions from the Victor Talking Machine Company. The latter is included in the reprint referred to above. The manuals for the Seashore and Kwalwasser tests and the Schoen tests as given in the reprint are included with the material in this study.

Motor tests included in Kwalwasser's bibliography are Ream's "Tapping Test; a measure of motility" reported in the Monograph Supplement, volume 32, and adequately described in Kwalwasser's book;[1] and Seashore's "Simple Reaction Time" test described in Seashore's Psychology of Musical Talent.[2]

[1] p.30 Tests and Measurements in Music

[2] p.177

The list of knowledge or learning tests is longer. There are 1st) the Beach Standardized Music Tests, 2nd) the "Music Achievement Tests" prepared by Glenn Gildersleeve and put out by Teachers College, Columbia University, 3rd) the Kwalwasser-Ruch Tests of Musical Accomplishment," 4th) the "Hutchinson Music Tests," 5th) "Mosher

Group Tests," and 6th)"Torgerson-Fahnestock Music Tests." All of these are described and commented on by Kwalwasser and all except the Beach and the Mosher tests are included in complete form in the present study. The Beach test, which was the first in this field to be published (1920) is under revision at the present time and the new form is promised within the year. The Mosher tests are described in his book, "A Study of the Group Method of Measurement in Sight-Singing" published by Teachers College. The tests, we understand, are in use in mimeographed form at Columbia but have not been prepared for general distribution.

Appreciation tests include three: Kwalwasser's "Tests of Music Appreciation", two of the Courtis Standard Tests, (a) "Recognition of Characteristic Rhythms," and (b) "Recognition of Mood from Melody," and Trabue's "Scales for Measuring Judgment of Orchestral Music." The Kwalwasser and Courtis tests are included herein. Trabue's article may be found in Educational Psychology for December, 1923. It is described in brief by Kwalwasser.

There are two musical performance tests named: "Hillbrand Sight-Singing Test," herein included and the "Mosher Test of Individual Singing" included in Mosher's published report referred to above.

Non-standardized tests

In addition to these tests which are in rather general use and for most of which norms have been established there

are a number of tests which have been developed in Germany and in Great Britain and a few in this country which merit brief de-scription because of the fact that they deal with certain recognized traits of musicality which are more difficult of measurement but at the same time of probably greater importance in summing up a total picture of musicianship as the musician himself understands it. Since these tests do not bear the stamp of standardization, their value from a scientific point of view is less, but their approach to certain highly important complex factors will be welcomed by the artist to whom scientific exactitude means nothing if it does not satisfy or correspond with his own subjective experience.

The chief quarrel between the scientist and the musician in the matter of music tests is over the use of musical or non-musical material. The scientist deprecates the use of musical material in that it gives an immediate advantage to the musical person which consequently invalidates the test. The musician on the other hand contends that musicality cannot be tested except through the medium of music. It is probably true, as the tests go to show, that if the musical mind is analyzed into its fundamental capacities, as it has been by Seashore for instance, these capacities can be measured through the medium of certain fundamental attributes of sound which being elemental are therefore not music. It may be that musicality is a sum total of such

fundamental capacities. These factors can be measured with the greater exactitude in so far as they are really elemental. On the other hand, it is also true that however exact such measurements may be they are of small use to the musician, whose musical experience does not include the operation of these capacities in their elemental form. He is with right much more interested in knowing in a more general way the ratings of complex factors with which he must deal directly.

Despite this recurring disagreement between those who are constructing tests and those for whose benefit they are supposed to be constructed, there are encouraging prospects that the test movement will result before long in a development which shall carry into the measurement of the most complex factors of musicianship the scientific exactitude which characterizes the testing of certain minor details. Without the open-minded cooperation and interest of both musicianly and scientifically minded individuals however such a culmination is not to be expected.

Brief mention may be made of the more important German contributions to the testing movement.[1] Rupp contributed the first program for the testing of musical capacity. Heinitz made suggestions for the determination of native ability for various instruments. He wrote extremely simple themes which he dictated on the piano or the violin or flute and required his subjects -untrained in music - to reproduce them on the instruments. Schussler's study of unmusical

---

[1] Reviewed in Schoen (46) and Ogden (41)

children supplied data confirming the more direct tests of musicality of other investigators. Kovacs' study of musical memory suggests tests in that important field.

Revecz followed up his study of the boy prodigy by devising tests adapted to children and adults and to musically trained and untrained.. He tested first the rhythmic sense, using twelve groups of rhythms arranged in order of difficulty. These rhythms were first presented monotonically and reproduced with hand claps. Next these same rhythms were given melodically.

For the testing of absolute pitch a tone was sounded on the piano which the observer was required to reproduce on the instrument. The test for relative pitch was one which is quite commonly used. An interval is produced and then a different tone is sounded which the subject is asked to use as a base in reproducing an interval similar to the one originally given.

Other tests were concerned with the harmonic sense, - the vocal reproduction of the constituent tones of chords - melodic memory and playing by ear.

Lowery, (30) working in English universities, has devised a Cadence Test and a Phrase Test, both of which he has used successfully with his students. In the cadence test judgment was asked on the feeling of completeness produced by the use of the different cadence chords in varying positions. The cadences used were the full close or perfect cadence, the Plagal cadence, the half close or imperfect cadence, and the false or deceptive cadence. The test

was given in two parts, first twenty-five pairs of cadences in a major key and second, twenty-five pairs in a minor key, the key chord being sounded in each case before commencing. Lowery's criterion of correctness was standard usage in classical compositions.

The second, or phrase test, aimed to determine the ability to distinguish the difference between various ways of grouping a given series of notes. Fifty pairs of musical sentences varying from five to seven notes in length were given, the second sentence of each pair being either the same as the first or different in the matter of phrasing o only. The subjects recorded either "same" or "different."

In a later study (32) Lowery discusses musical memory as it is called into play in the recognition of musical themes by their general outlines, and suggests a memory test founded on such recognition as of practical importance both for performer and listener.

Adler (1) tested preferences for one or another kind of music, using pieces selected for excellence in either rhythm, harmony or melody, and distorting each in three ways, - dull, sentimental, chaotic. In a second series the subject was asked simply whether he liked or disliked the selection.

Gordon (18) gave tests on the memorizing of musical themes the results of which suggested a test for musical appreciation based on the comparison of memory for significant and

non-significant musical selections.

Most of these experiments illustrate the use of measures which are extremely difficult to construct so that they are wholly objective and properly controlled, and admit of easy and reliable scoring and yet which do nevertheless indicate to the musician vital elements in the total profile of musical responses.

Questionnaires and rating blanks and their use

A number of investigators of musical talent have employed questionnaires and rating blanks as part of their test material. It is of interest to compare the kind of information sought in these and the various forms used. Both have been used to complete the musical inventory of individuals and the rating blanks are often employed as checks on the validity of the tests.

Stanton, who uses the Seashore measures for the prognostication of musical ability at the Eastman School of Music, wishes to know of the children whom she examines, such facts as these: nationality and occupation of father; who in the family sings or plays? "At what places do you hear good music?" "Do you play by ear?" "Have you played a musical instrument in public?" "Alone or with a group?" etcetera.*

---

* For the full form of the questionnaire see Stanton, Hazel, Psychological tests of musical talent University of Rochester, N.Y.1925

Stanton uses also a rating blank for teachers which includes items on musical talent, musical feeling, technique, rhythmic action, tone quality, intelligence, application, achievement, and health. She asks also for the pupils greatest fault and greatest forte.

A questionnaire included in the study by Brennan on the Relation between Musical Capacity and Performance[1] (2)

---

[1] p.195

---

groups questions under the headings General information, Musical environment during youth, Musical education and training, Musical activity, Musical interests, Musical memory and imagination. A performance rating blank is also given.[2]

---

[2] p.201

Larson, in her Critique of the Consonance Test (29) includes a questionnaire which might have a more general applicability. She asks specific and detailed information on musical training, musical environment, musical expression, and enjoyment of music.

Gaw, in her Survey of a Music School (16) obtained information through personal inquiry on musical education, environment, character of performance, dominant interests

and ambitions, emotional reactions, creative imagination. She gives also in her report a form for teachers' rating.

Reference to those models mentioned as well as to the forms included in the appendix of this study will be of suggestive value in making surveys of musical talent.

DISCUSSION OF THE TESTS

Ratings of the various tests

In the consideration of any formal test it is pertinent to ask first, does the test really measure what it purports to measure, and second, how accurately does it measure whatever it does measure. In other words, what are its claims for validity and reliability. The scientist requires evidence on these two scores. Any test put out for general use must moreover satisfy the requirements for ease of administration and scoring. Beyond this, in order that a test may retain its place in a general testing program, it must be shown that the factor selected for measurement is of sufficient importance in the total situation under investigation to warrant its measurement. This is a second and ultimately the most important criterion of validity.

Since in this study a numerous and varied assortment of tests a re under consideration, it will probably be most profitable first of all to quote comparative rankings which have been established by investigators of tests in general and then to indicate briefly some investigations

which bear on the reliability and validity of the separate tests.

Kelley (25) has attacked the problem of choice between tests boldly by referring them to qualified judges for ranking. It is to be observed that the judgments on the music tests are given, not by musicians, but by competent authorities on tests in general. Nine tests are ranked in the following order: first, the Kwalwasser test of Musical Accomplishment, with the Mosher Sight Reading Test vying with it for first place; next four of the Seashore tests in the order, Rhythm, Tonal Memory, Sense of Intensity, and Sense of Pitch; the Beach Standardized Music Tests, followed by the Seashore test for Sense of Time and last of all his Sense of Consonance test. It is suggested in addition that for individual diagnosis value may probably be attributed to the first four tests, that two of the tests (intensity and pitch) may be considered to have group but not individual value while the remaining three are doubtful or not reported on.

The Seashore tests, according to data on reliability published by Ruch-Stoddard (44) rank Pitch highest, with Intensity and Memory second, Time next, Rhythm, and last, Consonance.

A summary of the Seashore tests given by Foster and Tinker(11) concedes that they yield "fairly reliable measures of certain basic psychological capacities." [1] According to

---

[1] p. 277

this account Memory and Pitch show the greatest reliability and Time and Rhythm the lowest. As to validity, these authors report that "validated against teachers' ratings for musical ability the highest coefficients are for memory and rhythm and these compare favorably with validity of group intelligence tests as validated against school grades."[1]

---

[1] p.278

It seems fairly well agreed among investigators that the Seashore tests do measure specific fundamental capacities since there is little or no correlation between the tests except in the case of Tonal Memory and Rhythm, where it is evident that memory spanis involved to a certain extent in the discrimination of rhythms. Most authorites have failed too to find any correlation with intelligence, which would indicate that these particular musical factors are distinct from general mental capacity.

Smith and Wright report in connection with the Seashore tests that the validity of the pitch test as measured by correlation with the teachers estimate of singing ability is not high. Of the intensity test it is asserted that its predictive value is not proved except that negatively speaking, very low sensitivity in this respect would unfit one to become a musician. Likewise the value of the test for the sense of time is largely negative.

Though investigators report widely varying results as to the relative rankings of most of the Seashore tests there seems to be pretty general agreement on two of them at least. The pitch test has been accepted as valid and reliable and the importance of a keen pitch sense in musical equipment is q quite generally conceded. The test for the sense of consonance is admittedly the least satisfactory of Seashore's battery of six. The criteria on which correct judgment depends are too difficult to keep in mind. Nevertheless, experiments indicate that the sense of consonance is a fundamental capacity and no doubt a revised form of the test will be constructed.

As a summary of the value of the Seashore tests Mursell's estimate seems to represent the experience of the majority who have used them for diagnostic purposes. He says:[1] "The tests enable us to give a little advice as

---

[1] Mursell, J.L. Principles of musical education, p.105

---

to the kind of musical training that can profitably be undertaken, but in the main this is negative." Again; "...the tests tend to measure the larger degrees of musicality, but not its finer subdivisions, and not its various kinds or qualities.....If employed with a recognition of their purposes and limitations, they are exceddingly useful."[2]

---

[2] ibid. p.106, 108.

The Kwalwasser Sensitivity Tests are still too new to be included in the discussions of test material referred to above. The test is open to the criticism that it is too short to prove highly reliable. Moreover the validity of testing native endowment through a test in which the material is chosen in accordance with established laws of melody and harmony - laws, that is, which are laid down in the text books - may be questioned. But whereas Kwalwasser is criticized for restricting his musical material to conventional tonalities, Seashore has been criticized for disregarding these familiar tonalities in his tonal memory test. Possibly there is need for both types of test material.

The Schoen tests, since they have not been published for distribution, depend for their standing on local data collected and reported by their author. The three tests, Relative Pitch, Tonal Sequence, and Rhythm have been subjected to experimental procedure to establish reliability and are reported "to correlate highly with musicalness as a whole, as manifested by actual accomplishment, and to possess high diagnostic significance."[1] Since however,

---

[1] Journal of Comparative Psychology, Vol.V, p.31

---

the tests have not been recorded they are subject to great variation in their presentation and it is highly probable that reliable results would not be obtained in the hands

of other than the original examiner. The validity of the tests however seems apparent and from the musicians point of view these tests are preferable to other more strictly objective tests in that they make use of musical material. The tests for relative pitch and tonal sequence, though they are not beyond criticism, would appear suitable for recording. The rhythm test, though theoretically sound, suffers from too complicated instructions.

Of the achievement tests on the whole it may be said, they rate high in reliability but their validity is more doubtful - that is to say, it is open to question whether the phases of knowledge which they measure have essential bearing on the desired ends of musical training. Their value as objective measures of the results of conventional teaching is probably their greatest justification. Teachers perhaps profit more from their use than do pupils. These tests suggest definite goals of teaching and may be made the basis of course content, although if they are, they lose their value as experimental tests of achievement.

The reliability of the Kwalwasser-Ruch test is supported statistically by reported coefficients ranging from .88 to .97. Figures for the parts of the test indicate that the sections on Knowledge of Key Signatures and on Knowledge of Musical Symbols and Terms possess the highest reliability[1] while Knowledge of Note Values ranks lowest.

---

[1] Kelley, Interpretation of educational measurements, p.340

The Kwalwasser-Ruch test is probably the best of the several tests of learning or knowledge, although in actual use in particular situations some of the other tests may be preferable.

Appreciation tests are still in process of development. The Kwalwasse Test of Music Appreciation is, as its author himself admits, misnamed. It is based on content of "appreciation" courses as given in the schools, or at least on the informational material which forms not only the largest but the most measurable part of the majority of such courses. The Courtis tests assume a relationship between musical impressions and verbal meaning which is debatable. Mohler's attempt to measure judgment of orchestral music[1] probably represents the best approach to the

---

[1] Reported by Trabue (59)

---

testing of this intangible but most vital phase of musicality.

Musical performance tests are also unfortunately limited. The importance of such tests is recognized and no doubt other tests will be standardized. The chief drawback in the construction of such tests is the difficulty of devising purely objective and uniform methods of scoring.

Applications and interpretations

The function of these objective tests of musical knowledge in the analysis of a musical situation is indicated in the study of Mosher's on The Goup Method of Measurement of Sight-Singing. The Mosher test corresponds in general content withtthe Kwalwasser-Ruch test. Through the correlation of results of this test with ability in sight-singing as measured by an individual direct test, and the analysis of data obtained, it was possible to determine the relative value of the separate tests in measuring sight-reading ac achievement. The converse effect of such a study on the determination of minimum essentials to be taught is worth consideration.

The uses to which the apititude tests have been put are of greater interest pshchologically than is the case with achievement tests, the results of which belong rather to the province of pedagogy. The Seashore measures have had a wide application over a period of nearly fifteen years. An early study by Seashore himself reporting the use of the phonograph records in a public school survey contains valuable suggestions as to the administration of the tests and the interpretation of results. The explanation of the grouping system,on the basis of the objective records, into Very Superior, Superior, Excellent, Good, Fair, and Poor (undetermined))carries with it a warning against averaging the ranks obtained in the different capacities. It suggests that the most stress should be placed on the possession of

the sense of pitch, with sense of time next and sense of intensity third. As secondary criteria in the classification of pupils, teachers' estimates of Brightness, Enjoyment of music, and ability in Singing and Rhythmic expression were recognized. While further use of the Seashore measures by many examiners in the past ten years has somewhat modified opinion as to their absolute value, the suggestions regarding them which were made by their originator when they were first put to use in the public schools are still pertinent.

These tests have been the subject of recent studies by Gaw who made comparisons of results for children and adults and on different reproducing machines for the same test. As a result of her experiments Gaw recommends a shortened form of the Time discrimination test and of the Tonal Memory test for use with fifth grade children. Her conclusions in regard to reproducing machines suggest that higher norms should be used for tests of pitch given with the Panatrope.

Stanton, at the Eastman School of Music, has made extensive use of the Seashore tests as basic measures (supplemented recently by a non-musical comprehension test) for the prognosis of musical achievement. She has evolved a five-fold classification of students according to results of tests administered on entering and uses this classification in the selection of studentsfor admission to the regular courses leading to degrees. A study recently

published [1] contains data which tend to justify the classifications.

[1] Stanton, Prognosis of Musical Achievement, 1929

In contrast to the experience of Stanton, who has found predictive value in the music tests, a report by Highsmith(24) on the use of various measures in selecting musical talent would indicate that the Seashore measures are of less value in predicting success in the different types of subjects ordinarily required of music students than are intelligence tests. Another study of achievement and capacity in music made by Wright(61) in Los Angeles revealed a very low correlation between subjective tests in musical ability and the Seashore tests when applied to college freshmen in the department of music.

Schoen, who has used five of the Seashore tests in conjunction with those of his own devising, has found in the results satisfactory "answers to the three important questions about the pupils musical talent, namely, how much talent does he possess as a whole, for what particular instrument, what factors need special care and attention, and what factors can be left to take care of themselves." [2]

[2] Musical Talent and its Measurement, p. 22

The relation between musical capacity and performance was the subject of a study by Brennan,(2) who found that students of superior musical capacity tended to excell in musical performance, and who reports the tests for tonal memory and for rhythm (according to the Revecz procedure) important in indicating performance ability. Brennan's results confirmed the assumption that training influences performance but has little effect on capacity tests.

In contrast to the frequently observed fact that the most musical individuals seem also to be the most advanced in school work are the correlations which have been found between results of tests of musical capacity and general intelligence tests. That a low correlation is the rule, as has been demonstrated by Fracker,(12) Highsmith,(24) Brown(4) and others, supports the assumption that the talent tests do measure distinct factors in musical capacity, and does not contradict the belief that brightness in general contributes to musical ability.

ADAPTATION OF TESTS FOR USE WITH THE BLIND

Need of objective measurement

The measurement movement, whatever its value, is one of the significant trends in education at present and it is therefore assumed that educators of the blind will wish to participate in its development. There has been gratify ing progress in the use with the blind of standard educational measures in subjects other than music. Musical

measurement is newer; it is even more subject to prejudicial criticism, and it elicits less interest as a rule from those who ought to be most interested in it - the musicians themselves - but if it has value for the sighted it should have at least equal value for the blind, and undoubtedly music and musical education are matters of greater moment among the blind than among the sighted.

There are certain rather generally accepted ideas in connection with the blind and music on which scientific tests may well be expected to throw new light. One is the current belief that the blind are superior in musical talent to the sighted. Another is the conviction, even among those who have worked with the blind long enough to doubt the belief in their superior talent, that every blind child should be given special training in music. There is, moreover, a very general assumption that music training means piano lessons (this of course is true not alone in the case of the blind). A blind child is usually discouraged from studying any other instrument than the piano or organ, or at least is led to think that piano lessons are the sine qua non of any further musical education.

Here then are questions which tests may be expected to help in answering. Are the blind superior in music? Is any superiority they may show due to innate capacity or to training? Do music, musical capacity, musical achievment, represent something unique for the child who does not see? Can we predict success in music in general or with any

particular instrument?

Any serious consideration of these questions will naturally raise others in connection with training on which music tests should also shed some light. Are we clear as to the objectives of music education for the blind child? Do they or do they not correspond with those established for his sighted brothers and sisters? Do the differences between braille and ink print music notation affect the rate of learning or the results of study? We expect our blind children to read, spell, and figure as accurately as sighted children. Do we expect their musical attainments to be less than, equal to, or superior to those of seeing children? Are we justified in our expectations? Do we even know whether our expectations are realized? If not do we know why?

Dr S. P. Hayes, who has for years directed psychological research in schools for the blind, makes this statement in regard to the object of mental tests in general: "The object of these tests is to assist the teacher in obtaining scientific knowledge of the abilities and attainments of the children under her care..... The need of objective measures in place of subjective estimate seems obvious to careful students of the subject. Even in schools for the blind, where the small classes and a full day's program offer unusual opportunity for an intimate acquaintance with the pupils one finds striking differences of opinion concerning the ability of the pupils and the same frequent failure in recognizing degrees of ability above

and below the average which has been so generally discovered in schools for the seeing."[1]

---

[1] Self-surveys in schools for the blind

Later, in reference to music tests, Dr Hayes remarks that the unusually favorable opportunities for the development of musical ability in schools for the blind seem to make music tests superfluous, especially since, according to him, the mechanical difficulties of administering the tests raises the question whether, when given to the blind, these tests really measure musical ability or intelligence.

It would seem, however, Dr Hayes to the contrary notwithstanding, that the need for objective measures mentioned by him in the first instance holds equally well in the case of music. Though there may be unlimited opportunity for development of musical ability there is every reason to suppose that the music faculty of a school will be as prone to subjective error of judgment in the administration of opportunity as are specialists in other subjects.

What is more, if Dr Hayes and his colleagues have succeeded, as a result of their long and careful study, in overcoming mechanical difficulties in the case of general intelligence tests, there is no reason why music tests should not receive the same care in adaptation rather than be discarded because they do present difficulties.

Braille music notation and the mechanics of braille

In order that the type of difficulties which are encountered in attempting to use standard material with blind children may be understood, a few points about braille music notation and its use and the general mechanics of braille reading and writing may be mentioned.

It should be pointed out first of all to those unfamiliar with methods of education among the blind that a sightless music student pursues his music study much as a sighted person does, that is to say, he learns to read, tactually, music symbols consisting of embossed dots in linear arrangement, whereas the sighted musician reads music by seeing symbols printed on a staff. With a few exceptions to be pointed out later, braille music is a symbol for symbol transcription of printed staff notation. Obviously the sightless person is excluded from "sight-reading" in the sense of following written music with the eyes while executing it with the hand on an instrument. He can however read with one hand while he plays with the other or he can reproduce vocally while he reads manually. In this sense he is able to "read at sight" if trained to do so.

Braille music notation may be written by the blind as well as read by them. For all braille writing, whether it be musical or literary, the same instruments are used and the same symbols employed (with of course different meanings.) The entire braille system is built up on arrangements and

combinations of any of six points or dots placed in a group or "cell" with dots number one, three, and five, in a vertical row at the left, dots two, four, and six. parallel to them and to the right. A heavy manilla paper is customarily used. Writing is sometines done on a specially constructed type-writer-like embossing machine, known as a braille-writer which operates much like a type-writer. The more common method of writing is with the aid of a "slate".

This instrument in pocket size is a small metal guide plate about an inch and a half by eight inches when doubled over and in use. This slate holds the paper in place and provides grooves and guiding "cells" for the small punching instrument or "stylus" with which the braille points are made. The slates when in place allow the writing of three or sometimes four lines, after which they must be moved into place lower down on the paper. With the slate the embossing must be done from the wrong side and from right to left in order that the finished product when removed from the slate will appear as it should be read - the dots forming the letters raised and in position for reading from left to right. While this sounds confusing and difficult, it must be remembered that it is the way the blind child is taught to write and therefore presents no particular difficulties to him. It is however extremely difficult for the slate writer to check up on his writing or correct mistakes as he goes along. He cannot even read what he has written without removing the paper from the slate and turning

it over.

Although the braille writing machine is free from some of these drawbacks, in that it presents a page which is readily "visible" to the operator while the writing is in process, its use for the music tests described in this paper is not assumed for the reason that few schools are equipped to furnish braille-writers to an entire class, nor indeed are all blind children trained in its use. Therefore, if the limitations of slate writing are borne in mind, the reasons for some of the changes indicated in the test procedure will be clearer.

The use of the typewriter for these tests is of course possible but it is not recommended since, even if it were feasible to provide enough machines for a group test, the noise is undesirable and moreover, the average blind pupil is too liable to make typing errors of which he would not be conscious.

It is to be understood then that the test material included and discussed in this study has been arranged specifically for groups of blind children using three or four line braille slates.

The technique of adaptation

It is apparatus difficulties primarily which make desirable - or indeed inevitable - certain differences in general procedure when tests designed for sighted subjects

are arranged for braille. To be specific:

First: The blind subject must read from one sheet and do his writing on another. There will be no filling in of blanks, or forms, no numbered spaces for answers, no underlining, circling, or crossing out, no placing of notes, or names under notes.

Second: In place of preliminary record blanks to be filled out, oral directions for the writing of the required information will be substituted - or possibly complete directions in braille may be prepared.

Third: There will be no erasures or substitutions once the answers are written although provision may be made in certain tests for a final revision of answers by rewriting them if desired at the end of the exercise or paper, in which case the last answer written will always be the one counted.

Fourth: The length of time given for the test will in most cases differ from that required or allowed in the case of pupils working with printed forms. In case of tests given with the phonograph however, the mechanics of writing will be so planned that the writer of braille feels no more hurried than the pencil writer.

Fifth: In tests where the time is limited as in the phonograph tests already referredtto, explicit directions will be given for the placing of slates, the spacing of answers, and the moving of slates into new positions.

Sixth: There will of course be required the least possible writing on the part of the subject, but in tests of the type which call for underlining or other marking of printed words or parts, the blind subject will in many cases be asked to copy the correct answer. He must too in all cases copy the number of the question or exercise.

These then are the main differences due to the mechanics of braille writing. The changes made in the test content will be discussed in connection with the various tests themselves.

Adaptation of phonograph tests

Of all the available music tests the type that most readily adapt themselves to use with the blind are those which are given on phonograph records - the Seashore tests and the Kwalwasser sensitivity tests for example. These may be given to blind subjects individually in exactly the same way in which they are given to anyone else. The blind subject simply gives his judgments orally and they are recorded by the experimenter or by a deputy on the regular printed blanks. Or, the subject may himself write his answers in braille or possibly on the typewriter.

These tests when given as group measures require slight adaptation for the blind. The chief factor to be considered is that slate writing of braille involves a distinct sound of the punching of dots and that the only danger of

one member of a group influencing the work of another when neither can see is through sound. For instance, a blind child who was inclined to copy, could distinguish the sound of his neighbor's two-dot letter from a three-dot letter. The Seashore tests require as answers either one of two alternative letters. In the pitch test the answers are either "H" for higher or "L" for lower. Fortunately "H" in braille is a three-dot letter ⠒ and "L" is likewise a three-dot letter ⠇ consequently the directions to the listener given in the manual need no change whatsoever.

For the second test, on the sense of intensity, the listener is told to record "S" if the second tone is stronger or "W" if it is weaker. Now "S" in braille is a three-dot letter while "W" is a five-dot letter. Therefore, braille writers will be instructed to write "L" if the second tone is louder or "S" if it is softer.

Right here a word should be said in regard to the temptation to choose arbitrary answer symbols which satisfy the mechanics of writing without considering the psychological association of the symbol with the idea symbolized. When the Seashore tests were used for the first time a number of years ago in the institute for the blind in New York - where as it happened another system of point writing was then in use - it was necessary to find new symbols for answers to the high and low test. It was decided to use a dot in the upper part of the cell for high and one in the lower part for low. This was simple and logical and altogether

good. It was so simple in fact that when it came to the intensity test the suggestion was made that the same symbols be used, this time the upper dot to mean weaker and the lower to mean stronger. It was only the psychologically minded in the group who saw the objections to this too easy solution.

Two other tests in the Seashore set of six require no change of answer form for braille - the tests for the sense of time and the sense of rhythm (fortunately three-dot letters are the commonest." The consonance test required study. The judgment called for is on blending, smoothness, and fusion and the judgments to be better, a two-dot "B" or worse, a four-dot "W." It was finally decided that the terms more consonant or less consonant fulfilled the requirements of Seashore's criteria as well as providing two three-dot letters, "M" and "L", to be used for answers. After this decision was made its wisdom was confirmed by reference to a study of Larson's (29) in which she made the identical change, using more or less consonant as terms of judgment in place of better or worse because she felt this more nearly met the requirements of the test.

The tonal memory test presents a problem which as yet has not received a very satisfactory solution. The answers to be written are the numbers 1,2, 3, 4, 5, or 6. Now these numbers not only require the use of different numbers

of dots but if properly written require a number sign in front of each. (Without the number sign they are letters.) The use of the number sign before each number would take more time then is allowed by the record. The number sign might well be understood and not written since all of the answers are numbers but there would remain nevertheless the sound difference between a one-dot number one, and a three-dot number four. The solution which is suggested is the use of the dots according to their own place numbers, as they are learned and ordinarily designated, that is, dots one, three, and five, on the left, and two, four, and six, on the right. This however brings up an added difficulty: these dot positions are relative only, that is to say, one dot standing by itself has no meaning. It is braille context which gives it exact position. In addition to the point, then, it is necessary to write something which will give it place. The symbol which seems best adapted both mechanically and psychologically is the letter "D" standing for dot. The braille pupil will then in writing the answer "3" for instance write letter "D" followed by dot number three. This will occupy two cells and spacing of the fifty answers must be planned accordingly. Since pupils are supposedly familiar with the dot numbering but are not accustomed to using dots in this way, preliminary practice may be necessary. The alternative to this modification of the tonal memory test would be to give this one measure individually and have the pupils answer orally.

Kwalwasser's tests of melodic and harmonic sensitivity are also recorded and may be easily used with blind pupils. The only change necessary is that whereas the directions call for the recording of "G"s and "B"s standing for good and bad, the instructions for braille will ask for "G"s and "N"s, that is, good or not good which seems to satisfy psychological requirements.

Adaptation of printed tests

In the case of the printed tests about to be discussed, all of the modifications and changes have been arranged by the writer, who, as a music teacher for blind pupils, is familiar with braille music notation and its use; the brailling has been done by an experienced transcriber, who was able to suggest improvements in form and in many cases avoid confusion between literary and musical braille symbols. All of the material has then been proof-read back to the writer by a blind music teacher who has passed judgment not only on the accuracy of the transcription but on the clarity of the directions and the arrangement of the test material.

In the brailling of printed tests it is well to consider carefully the arrangement of the tests page by page. In the Gildersleeve Musical Achievement test for example Test 1 occupies about a fourth of a page. In braille, the directions occupy one page and the test itself another. Wherever possible a new test or part is begun on a new

page, thus facilitating a selection of questions if such should seem advisable under certain circumstances, and also making it possible to distribute the various test items separately if desired. It must be constantly borne in mind that a braille reader has greater difficulty keeping his place than the reader of a printed copy especially when, as in these tests he is required both to read and to write answers, always using two papers. Space saving is always desirable in braille and determines form in most cases but in psychological tests the ease and convenience of handling by the subject is the first desideratum.

In the adaptation of printed tests the text of standard forms has been followed as literally as possible in braille. There has been no attempt to improve on the directions as given. The only modifications are in the interests of braille mechanics. The braille transcription however which is placed in the hands of the pupils omits all record blanks and other such parts which are not to be actually used by the pupil. It is assumed that the examiner will have in his hands the printed form with the modifications for braille inserted in type. (In the case of a blind examiner the entire form could be done in braille for his use.)

In discussing the adaptation of printed tests certain typical questions chosen from the various tests will be used as illustrative material and the changes required will be explained. The Gildersleeve Musical Achievement Test

contains several tests wherein lists of terms are given and side by side lists of explanations or definitions which fit these terms. Test 3 for instance contains three such sets of lists, the three different sets being separated by heavy lines. In the braille copy these three sets will be designated Parts 1, 2, and 3. In each case the items in the first list will be lettered instead of being preceded by blanks for answers, while the items in the second list will be numbered as they are in print. The two lists will appear on separate pages in braille. The directions in print read, "Below are two lists. List "A" contains words, names, and terms which are common in music. List "B" gives a defin finition or an explanation for each item in List "A". In th the blank space before each word in the first list write the number of the definition or explanation in the second list which corresponds. Check each number as it is used. The sample is correct." (The sample shows a "4" in the blank before the first item which is solo.)

The braille directions read: "Following are two lists. List "A" contains words, names, and terms which are common in music. List "B" gives a definition or an explanation for each item in list "A". Read through both lists and decide which explanation in list "B" belongs to each item in list "A". Write on your answer paper the letter designating the word, name or term in list "A" and following it the number standing for its correct explanation or definition in list "B". Do not copy words. Write only designating letters

and numbers. For example, item "a" in list "A" is solo. Reading through list "B" we find, "4. A composition for one performer." This is the definition for solo. Therefore, write on your paper "a--4" Write your answers in any order. After you have finished go over the lists and your answers. If you wish to rewrite any answers do so at the end. Your last answer for any question will be the one counted."

Another type of test which is transcribed into braille with very little modification is the "recognition test" as exemplified by the Hutchinson Test No 1. This is for silent reading and recognition. It consists of six groups of excerpts from standard compositions, each followed by twice as many titles, listed and numbered. The student is directed to place the number designating the correct title in front of each example given. A trial group is provided which is to be done with the assistance of the teacher. This entire test is almost literally transcribed into braille, the only change being that the musical examples are lettered and the pupil directed to copy the designating letter and the appropriate nember for its correct title onto his answer page. Each group must of course be carefully numbered. (As it happens, the published copies of this test are very inaccurate and in places almost illegible so the braille copies in this instance are an improvement on the original.)

The Kwalwasser Test of Music Information and Appreciation contains a number of true-false tests. These go very readily into braille although instead of using the plus

and minus signs which are in use in braille the letters "T" for true and "F" for false are substituted, for the reason that the plus and minus signs are so nearly identical ⠲ ⠴ that they might too easily be wrongly written.

Tests which involve questions about musical symbols present new difficulties. It is true that every symbol in ink-print notation has its equivalent in braille. This is logical and on the face of it simple. But whereas in staff notation a musical symbol is easily recognized as such even if its name or meaning is unknown, in braille an isolated symbol of dots "looks like" a letter, a musical symbol, or a number, according to whether it is met in a situation known to be literary or musical, or whether a preceding sign designates it as a number. There are in braille, a word sign, a letter sign and a music sign for use where ambiguity is likely but their use in most connections is superflous and should be avoided if possible in psychological tests since their frequent introduction would add an unfamiliar element which would be undesirable. Consider then a test such as the Kwalwasser-Ruch Test of Musical Accomplishment. Test 1 is for knowledge of musical symbols and terms. The directions read: "Below are twenty-five questions about music. Five answers are given to each question. Read each question and then draw a line under the right answer." These directions are easily changed to provide for copying the right answer instead of underlining it, but note for instance the second question:

"A quarter note (the symbol is given) is called a rest, natural, sharp, note, flat." In braille the symbol in use for a quarter note (it is customarily "C a quarter") is the "th" sign, which moreover in contracted braille stands for "this". The question therefore if literally translated, reads: "This is called a rest, natural, sharp, note, flat." In view of such ambiguity therefore all of these questions have been changed to read: "The sign so-and-so in music is called ....."

In the transcribing of symbols themselves a few changes are necessary. In order that a certain consistency should be established in the various tests arranged, a list was made of all of the isolated symbols used in such questions, the symbols and terms requiring alteration were noted and the following substitutions were decided upon:

For repeat-bar the braille sign known as "repeat-strain" was used and this name substituted.

In place of bar, double-bar was substituted, since the bar is usually represented by a space in braille.

Staff, symbol and name, which is not used in braille, was omitted and in its place an "interval sign" (third interval) which has a use peculiar to braille was used and the word interval substituted.

For clef, hand-sign was substituted, since the clef signs are not in common use in braille while the hand-signs meaning much the same thing are. For the treble clef, the right-hand sign was used and for the bass, the left.

In all questions using both the whole note and the sixteenth note a dotted half note was substituted for one of them since in braille wholes and sixteenths are alike and are easily distinguished when in actual use by their context. Likewise, since whole rests and sixteenth rests are also similar, a dotted quarter rest was substituted where two signs were necessary.

Other parts of the Kwalwasser-Ruch Test are typical of a number of other tests and deserve comment.

Questions having to do with syllable names have been retained even though it is realized that the use of syllables with the blind is not as common as with sighted children. These questions however would have value in those classes where the tonic sol-fa system is in use.

Questions requiring the naming of keys must have directions very carefully worded so that there may be no possible misunderstanding as to whether the key is to be named by its letter name of by its key-note symbol. The letter "D" in braille is the symbol for the music note "C". But writing it "C a whole note" would avoid any ambiguity.

Questions on the recognition of pitch names have been necessarily omitted since in braille a note is recognized only by its name - it has no position on the staff.

With these exceptions the questions were transcribed without change and seem to represent about equal degrees of difficulty for ink and braille readers.

The Hillbrand Sight-Singing test has been included in toto for the sake of those schools which are stressing singing from note as part of the blind childs music education. The transcription is literal; the only point to be noted is that the melodies are written with one complete phrase to a line wherever possible, each line of music being followed by a line of words.

The Torgerson-Fahnestock music tests come in two parts. Part A tests theoretical knowledge. Most of the test directions read "draw a line around"(or otherwise mark) certain signs. Braille directions read "copy" the whole note (or other sign.)

Part B tests ear training. While an ear training test would be particular desirable for blind students, no attempt has been made to adapt the Torgerson-Fahnestock form since the methods of recording in all of the four parts of the test are ill-adapted to braille writing. The form is included as it stands as it has suggestive value at least.

In general it may be emphasized that in arranging tests for braille pupils, apparently unimportant details deserve the most careful consideration as their neglect may cause enough confusion on the part of the subject to invalidate the test. For example, it was brought to notice in the proof reading of these tests that the period after exercise numbers whould be omitted since a number followed by a period is exactly like a time signature in music and

in tests of this sort might be mistaken for one. It is safer indeed to precede every exercise number by "Ex." or "No." It was also brought to attention that a series of whole notes or half notes written on a staff without bars, when translated into braille would be read as sixteenth notes or thirty-seconds. While these might be used in place of the longer values it is better in braille to space them one in a measure, even thought no time signature is used. One last point should be mentioned, namely that the key signature for the key of C or A minor, with no sharps or flats is represented in staff notation by the absence of sharps or flats on the staff; in braille it is shown by an absolute blank which without context looks like a mistake. Since this is the only correct way that a natural key signature may be represented in isolation, it is suggested that the examiner call the attention of the pupil to the fact that such and such a question number has a blank after it, that this is not a mistake but represents a key without sharps or flats.

Administration of the tests

The following suggestions as to the administration of the tests to blind children are tentative only and are open to revision when the tests are actually tried out.

It is recommended that, since the two kinds of braille paper, the white and the manilla are in general use, one kind be used for the question forms and the other for the

answer sheets. This will make it much simpler to keep the two separate when they are collected.

Directions for the writing out of preliminary data should be given orally and very explicitly. Such data should be written on a page by itself and plenty of time and help given to be sure that it is done correctly.

Directions should be read aloud while the pupils follow their braille copies and care be taken that the directions are understood before the test is begun. The pupils should be warned that after the test proper has begun they may not ask questions.

Monitors may assist in the giving out and collecting of papers.

The tests may be divided into parts and short rest periods allowed between if the test is a long one.

In the phonograph tests warning should be given against writing answers until the pause between items occurs.

The pupils should understand the general procedure for the test before they are given the specific directions, that is, if it is a matter of reading several possible answers and then selecting one right one and copying it on their own answer papers this method may be discussed first unless the pupils have had practice in taking other tests in this way.

The pupils must be impressed with the necessity for numbering every answer with the greatest care since there is no other way for the person scoring to know which answer

belongs to which question.

Names or initials must be placed on every answer sheet. The name or designating abbreviation for the test may be written on the papers in pencil as they are collected to avoid any possibility of not identifying the test for scoring.

No time limit can be set at the present time for any of the tests. It is suggested that the test be closed when all but the slowest two or three in the class have finished. Careful record should be kept of the total time used for the test.

Scoring the tests

The results for the phonograph tests may be scored from the braille copies. No further knowledge of braille is required than a simple recognition of the difference between the two letters used in each test. There is no such wholesale method of handling the papers as is suggested in the Seashore directions for public school use but on the other hand papers are not likely to be collected in such numbers when the tests are given to the blind. Braille keys are furnished for both the Seashore tests and the Kwalwasser sensitivity record and the errors may be most easily found by a sight comparison. Wrong answers should be circled with red and the per cent. of correct answers computed according to directions in the manual. Since norms for the blind have not yet been established, the percentile rankings as given by the authors may be accepted tentatively,

but all records should be preserved and these should show the age, grade, and per cent. of right answers as well as the rank for each pupil in each test given.

The printed tests will probably be most easily and satisfactorily scored by having the braille answer papers read to a sighted person who will transcribe the answers on to one of the regular printed test forms, since in most cases these provide space for the scores. These papers may then be filed for reference. Of course results might be read from the braille papers and errors noted by reference to the printed copy without transcribing, but if this is done great care must be taken that the records are accurate and complete.

In the case of the printed tests where certain parts have been omitted it must be remembered that the scores obtained will not be comparable with scores for a sighted group doing the whole test. The total score possible for the braille form is given in each case with the test or manual. Here again standardization of scoring will have to await the establishment of norms.

Suggested forms for questionnaires

After a careful study of the outline forms for the collection of informational data which in many cases accompany the tests themselves, several forms have been selected or compiled which seem best suited to the circumstances which obtain in general among blind groups. These

have been included in the appendix. As will be seen, one is a simple outline form for preliminary data to accompany any test. Others are for more extended information concerning training, interests, or environmental influences, etcetera.

A TENTATIVE PROGRAM FOR THE FURTHER DEVELOPMENT OF MUSIC TESTS FOR THE BLIND

All of the foregoing material has been collected and arranged with a definite and practical end in mind, namely, its immediate use and consequent development for greater usefulness. Therefore, in conclusion, a brief consideration of the situation in schools and classes for the blind may point a way to that end.

In any attempt to compare music courses for the blind with those for the sighted only the broadest generalizations can be made. There are, for the sighted, public schools, private schools, schools of music - all with their own approaches to the problems of music and music education. Similarly in the case of the blind. There are residential schools, day school classes, and the same schools of music which the sighted attend. If we choose to compare the average public school music classes for the sighted with the typical residential school music work for the blind, it is because we wish to emphasize <u>differences</u> rather than similarities. It must be borne in mind always that we are making comparisons solely on the basis of applicability of the tests under discussion.

The residential schools for the blind, almost without exception, have highly specialized music departments. It is probably true however that these schools show less uniformity among themselves in their courses of study for music than do our public schools, but on the other hand, it is evident to all who have followed public school progress in recent years that school music, possibly more than any other subject, has been undergoing radical and rapid alteration. (This change, incidentally, is closely bound up with the test movement.) Therefore, what may be said of public schoool music must be qualified by "once" and "now" while in music for the blind it is a matter of "here" and "there."

In general it may be said of music as taught to the blind that instrumental instruction - piano and organ - receives more emphasis than vocal music; that music reading is much more often applied to playing the piano than to singing; that the number of pupils is much smaller; there is more individual than group instruction and classes where they do exist for music show much greater range in age, grade and ability of pupils. It must always be remembered too that classes for the blind include pupils who have lost their sight under varying circumstances and have had different adjustments to make. There are more who are retarded for reasons which do not have to be considered in the case of normal children.

In view of these differences it is hardly to be expected that a testing program which has been found workable

in the public schools can be taken over bodily for use in schools for the blind. What is more it would be unsafe to predict the extent or even the direction of the deviations. For these reasons the present study is to be regarded as preliminary and incomplete. The material is collected, presented in useable form for the blind and discussed. This is only a beginning; but it marks a definite step upon which any further or more conclusive steps must depend. It is hoped that the inclusion of a great variety of tests, in such form that they may readily be used with groups of blind children, will encourage teachers in schools for the blind to select those tests that appear best suited to their purposes and give them trial.

These tests even in their present imperfect form, may be expected to yield certain practical results. The aptitude tests should prove adequate for a general sifting out of prospective musicians. Even if they do no more than corroborate objectively a teacher's estimate they will have been worth giving. They may serve also as a general guide in suiting the instrument to the pupil.

The achievement tests should prove to be constructive aids in the evaluation of the content of music courses offered. Minimum essentials in musical information should be correlated with pupil ability rather than with theoretical concepts of standards of knowledge. On the basis of objective measurements it should be possible to mold training courses to suit the individual or at least to differ-

entiate between the needs for the three distinct types of musicians, the composer, the performer and the listener.

Whether rejected or adopted, these tests indicate methods of adaptation which should simplify the adapting of the improved tests which will without doubt appear in the future. Those who are responsible for the direction of musical opportunities for the blind should be on the alert to take advantage of the development of such tests.

The cooperation of all who are interested in using any of the material included herein is strongly urged to the end that the full worth of any attempt at music testing among the blind may be ultimately reached.

BIBLIOGRAPHY

1. Adler, M.J.: Music appreciation: an experimental approach to its measurement. Archives of Psychology, No.110 1929,

2.Brennan, F.M.: Relation between musical capacity and performance. Psychological Monographs, Vol.36, pp.190-248, 1926

3. Broom, M.E.: The Seashore measures of musical talent School and Society, Vol.30, pp.274-275, 1929

4. Brown, A.W.: The reliability and validity of the Seashore tests of musical talent. Journal of Applied Psychology, Vol.12, pp.468-476, 1928

5. Cox, Catherine M.: Genetic studies of genius, Vol.II, The early mental traits of 300 geniuses. Stanford University Press, 1926

6. Dykema, P.W.: Evaluating music. Teachers College Record Vol.29, pp.181-193, 1927

7._____ Tests and measurements in music. Music Supervisors National Conference Proceedings, 1925

8. _____ Why should the music teacher be interested in tests and measurements? ibid. 1927

9. Farnsworth, Paul R.: Reply to Dr Lanier's note on the Seashore tests. Journal of Educational Psychology Vol.20, pp.693-694, 1929

10. _____ The Spearman-Brown prophecy formual and the Seashore tests. ibid. Vol.19, pp.586-588, 1928

11. Foster, W.S. and Tinker, M.A.: Experiments in psychology Henry Holt and Co., N.Y., 1929

12. Fracker, Geo. C. and Howard: Correlation between intelligence and musical talent among university students. University of Iowa Studies in Psychology No.12, (Psychological Monographs, Vol.39, pp.157-161) 1928

13. Gaw, E.A.: Five studies of the music tests. ibid. pp.145-156

14. _____ Revision of the consonance test. Psychological Monographs Vol.25, pp.134-147, 1918

15. _____ Some individual difficulties in the study of music. Journal of Educational Research, Vol.5, pp. 381-388, 1922

16. _____ Survey of musical talent in a music school. Psychological Monographs Vol.31, pp.128-156, 1922

17. Gilliland, A.R. and Jensen, C.R.: Reliability of the Seashore record for the measurement of pitch discrimination. Journal of Experimental Psychology, Vol.5, pp.214-222, 1922

18. Gordon, K.: Some tests on the memorizing of musical themes. ibid. Vol.2, pp.93-99, 1917

19. Hayes, Samuel P.: Self-surveys in schools for the blind. Pennsylvania Institution for the Instruction of the Blind, No.2, Dec., 1921

20. _____ Ten years of psychological research in schools for the blind. ibid. No.4, 1927

21. Heinlein, C.P.: Critique of the Seashore consonance test: a reply to Dr Larson. Psychological Review, Vol.36, pp.524-542, 1929

22. _____ Brief Discussion of the nature and functions of melodic configuration in tonal memory, with critical reference to the Seashore tonal memory test. Journal of Genetic Psychology Vol.35, pp.45-61, 1928

23. _____ Experimental study of the Seashore consonance test. Journal of Experimental Psychology Vol.8, pp. 408-433, 1925

24. Highsmith, J.A.: Selecting musical talent. Journal of Applied Psychology, Vol.13, pp.486-493, 1929

25. Kelley, Truman L.: Interpretation of educational measurements. World Book Co., 1927

26. Kwalwasser, Jacob: Tests and measurements in music. C.C. Birchard and Co., Boston, 1927

27. Lanier, Lyle H.: Note on reliability predictions for the Seashore music tests. Journal of Educational Psychology Vol.20, pp.691-692, 1929

28._____ Prediction of reliabilities of mental tests and tests of special abilities. Journal of Experimental Psychology, Vol.10, pp.69-113, 1927

29. Larson, Delia L.: Experimental critique of the Seashore consonance test. University of Iowa Studies in Psychology No.11, (Psychological Monographs Vol.38 pp.49-81) 1928

30. Lowery, H.: Cadence and phrase tests in music. British Journal of Psychology, Vol.17, pp.111-118, 1926

31._____ Fundamental considerations in the study of musical ability. Journal of Educational Psychology, Vol.20, pp.584-587, 1929

32. _____ Musical memory. British Journal of Psychology, Vol.19, pp.397-404, 1929

33. Maxfield, Kathryn E.: Adaptation of educational tests for use with blind pupils. American Foundation for the Blind. N.Y., 1927

34. McGinnis, E.M.: Seashore's measures of musical ability applied to children of the pre-school age. American Journal of Psychology, Vol 40, pp.620-623, 1928

35. Mjoen, J.A.: Inheritance of musical ability. Child Study, Vol.5, No.7, pp.3-5, 1928

36. Moos, Jean Corrodi: Yardstick applied to musical talent. Musical Quarterly Vol.16, No.2, April 1930

37. Mosher, Raymond M.: Study of group methods of measurement of sight-singing. Teachers College, Columbia University Contributions to Education, No.194, 1925

38. Mursell, J.L.: Principles of musical education. MacMillan Co. N.Y., 1927

39. National Research Council: Survey of tests and measurements. Music Supervisors Journal, May 1927, pp.17-31

40. Norris, Herbert T.: Critical review of tests and measurements in music education. ibid. Dec. 1926, pp.57-59

41. Ogden, R.M.: Summaries on hearing. Psychological Bulletin, 1911-1920

42. Pear, T.H.: Classification of observers as "musical" and "unmusical." British Journal of Psychology, Vol.4, pp.89-94, 1911

43. Ream, Merrill: The tapping test, a measure of motility. Psychological Monographs, Vol.31, pp.293-319, 1922

44. Ruch, G.M. and Stoddard, G.D.: Tests and measurements in high school instruction. World Book Co., 1927

45. Schoen, Max: Musical talent and its measurement. Musical Quarterly, Vol.14, pp.255-282, 1928

46. _____ Recent literature on the psychology of the musician. Psychological Bulletin, Vol.18, pp.483-489, 1921

47. _____ Tests of musical feeling and musical understanding. Journal of Comparative Psychology, Vol.5, pp.31-52, 1925

48. _____ Validity of tests of musical talent. ibid. Vol.3, pp.101-122, 1923

49. Seashore, C.E.: Measures of musical talent: A reply to Dr C.P.Heinlein Psychological Review, Vol.37, pp.178-183, 1930

50. _____ Psychology of musical talent,The. Silver, Burdett and Co., 1919

51. _____ Survey of musical talent in the public schools. University of Iowa Studies, Vol. I, No.2, 1920

52. _____ and Mount, G.H.: Correlation of factors in musical talent and training. Psychological Monographs, Vol.20, pp.47-92, 1918

53. Smith, Henry L. and Wright; Tests and measurements. Silver, Burdett and Co., 1928

54. Stanton, Hazel M.: Measuring musical talent. Seashore tests as administrative aids. Personnel Journal, Dec.,1928, pp.286-292

55. _____ Prognosis of musical achievement. University of Rochester Studies in Psychology, Vol.I, No.4, 1929

56. _____ Psychological tests of musical talent. University of Rochester, N.Y., 1925

57. _____ Report on use of Seashore tests at Eastman School of Music. Music Supervisors Journal, March, 1926, pp.20-26

58. _____ Seashore measures of musical talent. University of Iowa Studies in Psychology No.12, (Psychological Monographs, Vol.39, pp.135-139) 1928

59. Trabue, M.R.: Scales for measuring judgment of orchestral music. Journal of Educational Psychology, Vol.14, pp.545-561, 1923

60. Williams, C.O.: Critique of measures of musical talent. Music Supervisors Journal, Oct. 1929, pp.67-81

61. Wright, Frances A.: Correlation between achievement and capacity in music. Journal of Educational Research, Jan. 1928, pp.50-56

PRELIMINARY DATA

(To be supplied by the pupil for every test given)

Name Age (years and months)

School Grade

Name of test Date Hour

PERMANENT RECORD

(Data for filing with test results)

To be supplied by pupil or teacher

1. Name 2. Date of birth

3. School 4. Grade

5. How long have you been in school (class) for blind?

6. Did you study music before that?

   a. Vocal? b. Instrumental? (name instrument)

   c. In class? d. Private lessons?

   e. For how long?

7. Have you studied music since entering school (class) for blind?

   a. Vocal? b. Instrumental? (name instrument)

   c. In class? d. Private lessons?

   e. For how long?

8. Do you like to sing?

9. Do you like to play?

10. Do you like to listen to music?

To be supplied by teacher

Date of blindness Cause

Amount of vision I. Q.

School grades in music

   Lowest Highest

Remarks

TEACHERS ESTIMATE

OF MUSICAL ABILITY AND ACHIEVEMENT

Ratings on the basis of

A -- Superior

B -- Very good

C -- Average

D -- Poor

E -- Very poor

Pupils name Teachers name

Date

Number of months you have taught this pupil

1. Native talent?
2. General rhythmic ability?
3. Technical ability?
4. Powers of application?
5. Rate of progress?

INDEX OF TESTS

1. Cleveland Music Test. Local. Mimeographed form.

   a. Test form

   b. Manual

   Braille copy: 17 pages, 1 inserted (9½)

2. Courtis Tests. Recognition of characteristic rhythms and Recognition of mood from melody. By Harriet Petry and Marie Rasey. Published: 1922. Purpose: to measure pupils' ability to interpret life's activities and moods in terms of music. Range: grades 4-12. (Time to give: 10 minutes. Time to score: short.) Standardized.
   Publisher: S.A.Courtis, 1807 East Grand Blvd. Detroit, Mich.
   Price: $1.80 for set of 40 tests; $2.50 for set of 80 tests; specimen set, complete 80¢

   a. Test form

   b. and c. Instruction folders

   Braille copy: 12 pages

3. Hillbrand Sight-Singing Test. By E.K.Hillbrand. Published: 1924. Purpose: to obtain an objective measure of the ability of a pupil in the mechanics of oral sight reading in vocal music as an indication of progress made and the diagnosis of difficulties. Range: grades 4-6. (Time to give: 10 minutes. Time to score: 5 minutes.) Standardized.
   Publisher: World Book Co., Yonkers-on-Hudson, N.Y.
   Price: $1.00 per package of 25 examination booklets, complete; specimen set, 10¢

   a. Test form

   b. Manual of directions

   c. Class record

   Braille copy: 6 pages

4. The Hutchinson Music Tests: No.1. By Herbert E. Hutchinson and L.W.Pressey. Published: 1924. Purpose: "to test ability in silent reading and recognition of musical scores from known songs and operas." Range: grades 7-12. (Time to give: no time limit. Time to score: short.) Standardized tentatively.
Publisher: Public School Publishing Co. Bloomington, Ill.
Price: 50¢ per package of 25; specimen set 10¢

a. Test form

b. Direction sheet

Braille copy: 15 pages

5. Krone Recognition Test. By Max Krone. Local. Mimeographed form.

One form

Braille copy: 11 pages

6. Kwalwasser Tests of Melodic Sensitivity and Harmonic Sensitivity. By Jacob Kwalwasser. Copyright: 1926. Purpose: to measure and evaluate the aesthetic attitude which constitutes music appreciation. Time to give: about 15 minutes. (Time to score: short.) Standardized tentatively.
Victor Talking Machine Co. Record No.35773.
Price: Manual of directions free.

Manual of directions

Braille key

7. Kwalwasser Test of Music Information and Appreciation. By Jacob Kwalwasser. Published: 1927. Purpose: to measure factual knowledge of music. Range: high schools and colleges. (Time to give: 40 minutes.) Standardized tentatively.
Publisher: Bureau of Educational Research, University of Iowa
Price:

a. Test form

b. Manual of directions

c. Answer key

Braille copy: title page, 28 pages

8. Kwalwasser-Ruch Test of Musical Accomplishment. By Jacob Kwalwasser and G.M.Ruch. Published: 1924. Purpose: to measure objectively the progress of pupils in music. Range: grades 4-12. (Time to give: 40 minutes. Time to s score: 3 minutes.) Standardized.
Publisher: Extension Division, University of Iowa.
Price: 6¢ per copy; $5.00 per 100; specimen set 10¢, with manual 16¢

a. Test form

b. Manual of directions

Braille copy: title page, 25 pages

9. Musical Achievement Test. By Glenn Gildersleeve. Published: 1921. Non-standardized.
Publisher: Institute of Educational Research, Division of Field Studies, Teachers College, Columbia University.
Price:

One form

Braille copy: title page, 18pages, 2 inserted (½s)

10. Seashore Measures of Musical Talent. (Based on the author's Psychology of Musical Talent.) By C.E.Seashore. Published; 1919. Six Columbia records. Purpose: to test fundamental musical capacity. Range: grades 5-8. Time to give: about 90 minutes. (Time to score: 10 minutes.) Standardized.
Columbia Graphophone Co., New York
Price: $1.25 each record. Manual of instructions and interpretations 25¢

Manual of instructions

Braille keys: 6 pages

11. Schoen Tests. Three tests: Relative Pitch; Tonal Sequence; Rhythm. By Max Schoen. Published: 1925.
Published in Musical Talent and its Measurement, by Max Schoen.
Publisher: G.Schirmer, Inc., New York.
Price: 50¢

Manuscript of tests: pages

Braille copy: 14 pages
Relative Pitch: pages 1 and 2
Tonal Sequence: pages 3-6
Rhythm: pages 7-14

12. Torgerson-Fahnestock Music Test. By T.L.Torgerson and Earnest Fahnestock. Purpose: to measure attainment and progress of pupils in both the theoretical and practical aspects of music and to assist in diagnosing difficulties of pupils. Range: grades 4-8. (Time to give: approximately 30 minutes. Time to score: short.) Standardized tentatively. Publisher:
Publisher: Public School Publishing Co., Bloomington, Ill.
Price: 75¢ per package of 25 copies of Parts A and B, with direction booklet and class record sheet; specimen set, 15¢

INDEX OF TEST MATERIAL

1. Cleveland Music Test
    a. Test form
    b. Manual
2. Courtis Tests
    a. Test form
    b. and c. Instruction folders
3. Hillbrand Sight-Singing Test
    a. Test form
    b. Manual of directions
    c. Class record
4. The Hutchinson Music Tests
    a. Test form
    b. Direction sheet
5. Krone Recognition Test
6. Kwalwasser Tests of Melodic Sensitivity and Harmonic Sensitivity. Manual (Typed copy)
7. Kwalwasser Test of Music Information and Appreciation
    a. Test form
    b. Manual of directions
    c. Answer key
8. Kwalwasser-Ruch Test of Musical Accomplishment
    a. Test form
    b. Manual of directions
9. Musical Achievement Test (Gildersleeve)
10. Seashore Measures of Musical Talent. Manual
11. Schoen Tests

12. Torgerson-Fahnestock Music Test

    a. Test form Part A

    b. Test form Part B

    c. Manual of directions

    d. Class record sheet

Key to Braille Music Signs